

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

AMENDMENTS TO THE CLAIMS

1. (currently amended) A communication network, comprising:

- (A) local communication links,
- (B) a plurality of separately located central office switching systems interconnected via trunk circuits for selectively providing switched call connections between at least two of the local communication links in response to predetermined control data messages,
- (C) a signaling communication system for two-way communications of said control data messages between at least said central office switching systems, said signaling communication system interconnecting the central office switching systems;
- (D) a signaling gateway, separate from the central office switching systems and connected to said signaling communications system, said signaling gateway including an interface connected to a remote communications network and configured to exchange said control data messages between said remote communication network and said central office switching systems by way of said signaling communication system, and
- (E) a signaling system security monitor, separate from the central office switching systems, said signaling system security monitor including a plurality of message templates corresponding to approved individual ones of said control data messages, sequences of such control data messages and informational relationships between the data contents of such data messages, said signaling system security monitor being responsive to said message templates to perform syntax and content dependent screening of said control data messages, said content dependent screening including checking appropriateness of said control data messages in context of (i) a state of the communications network and (ii) prior related messages.

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

2. (original) The communications network according to claim 1 wherein said plurality of message templates are associated with a plurality of service providers.
3. (currently amended) The communications network according to claim 2 wherein said signaling system security monitor associates each of said control data messages with a corresponding one of said service providers and selects one or more of said message templates in response to the corresponding to one of said service providers.
4. (original) The communications network according to claim 1 wherein said signaling system security monitor includes a memory storing sets of templates, each of said sets corresponding to control messages appropriate to particular call progress or transaction flow.
5. (original) The communications network according to claim 4 wherein said templates define message formats, parameters and values associated with control message types selected from MTP, SCCP, ISUP, TCAP and AIN type messages.
6. (currently amended) The communications network according to claim 4 wherein said signaling system security monitor is configured to select from among said sets of templates in response to service provider authorization data associated with respective ones of said control data messages.
7. (currently amended) The communications network according to claim 1 wherein said signaling system security monitor is configured to selectively communicate and selectively modify so as to bring into conformance with expectations said control data messages between said signaling gateway and corresponding ones of said central office switching systems by way of said signaling communication system in response to said control messages satisfying criteria specified by corresponding ones of said templates.

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

8. (currently amended) The communications network according to claim 1 wherein said signaling system security monitor is configured to selectively (i) enable and inhibit said signaling gateway from exchanging and (ii) modify so as to bring into conformance with expectations said control data messages between said central office switching systems by way of said remote communication network and said signaling communication system.

9. (original) The communications network according to claim 1 wherein said signaling system security monitor includes a memory storing states of respective ones of said central office switching systems, said signaling system security monitor responsive to said states for selecting ones of said templates.

10. (original) The communications network according to claim 1 wherein said signaling gateway further comprises a signal protocol converter configured to convert SS7 type messages to another packet data format.

11. (original) The communications network according to claim 10 wherein the other packet data format is an Internet Protocol (IP) format.

12. (original) The communications network according to claim 1 wherein said signaling system security monitor is configured to monitor information contained in an MTP Layer 3 portion of said control data messages.

13. (original) The communications network according to claim 12 wherein said information contained in said MTP Layer 3 portion of said control data messages includes (i) a destination point code, (ii) an originating point code, and (iii) a service indicator octet.

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

14. (original) The communications network according to claim 12 wherein said signaling system security monitor is configured to monitor at least one of MTP, SCCP, ISUP, TCAP, and AIN messages.

15. (original) The communications network according to claim 12 wherein said signaling system security monitor is configured to monitor a plurality of message types selected from MTP, SCCP, ISUP, TCAP, and AIN type messages.

16. (original) The communications network according to claim 12 wherein said signaling system security monitor is configured to monitor calling and called party address parameters contained in SCCP message portions of said control data messages.

17. (original) The communications network according to claim 16 wherein said signaling system security monitor is configured to determine if said monitored calling and called party address parameters are consistent with an authorized signaling relationship.

18. (currently amended) The communications network according to claim 12 wherein said signaling system security monitor is configured to monitor origination and destination point codes and calling and called party address parameters contained in the header of an SCCP & TCAP message of said control data messages.

19. (original) The communications network according to claim 12 wherein said signaling system security monitor is configured to monitor the originating and destination point code parameters contained in the MTP message portion, as well as the calling and called party address parameters found in the SCCP message portion of said control data messages and determine if a particular originating application is authorized to send a particular TCAP message to a particular destination application.

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

20. (original) The communications network according to claim 1 wherein said signaling system security monitor includes a memory storing a state of said communications network.

21. (original) The communication network according to claim 1 wherein said signaling system security monitor includes a memory storing permissible states of said communications network and said templates include data indicating allowable next one(s) of said states.

22. (original) The communications network according to claim 1 wherein said signaling system security monitor includes a memory storing data relating call progress status with respective sets of control messages appropriate to initiate a next action consistent with a particular service.

23. (original) The communications network according to claim 1 wherein said signaling system security monitor includes a memory storing data relating a transaction state with respective sets of control messages appropriate to initiate a next action consistent with a particular service.

24. (original) The communications network according to claim 1 wherein said signaling system security monitor comprises a certification agent configured to exchange and maintain encryption key certificates.

25. (original) The communications network according to claim 1 wherein said signaling system security monitor is configured to issue and decrypt digital time stamps.

26. (currently amended) A method of securely interfacing control links of respective communication networks, comprising the steps of:

storing a plurality of control message templates;

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

exchanging control data messages between a remote communication network and a plurality of switching systems via a local signaling communication system;

selecting ones of said control message templates in response to respective ones of said control messages;

determining, using said templates, if said control data messages are proper including responsive to said message templates, performing syntax and content dependent screening of said control data messages, said content dependent screening including checking appropriateness of said control data messages in context of (i) a state of the communications network and (ii) prior related messages;

in response to said determining step, selectively communicating and selectively modifying so as to bring into conformance with expectations said, in response to said determining step, control data messages between said central office switching systems;

selectively routing messages from an incoming link to an outgoing link in response to said control data messages; and

selectively generating control messages to help restore system integrity in cases where control messages are disallowed.

27. (original) The method according to claim 26 wherein said plurality of control message templates are associated with a plurality of service providers.

28. (currently amended) The method according to claim 26 further comprising steps of:
associating each of said control data messages with a corresponding one of said service providers; and

selecting one or more of said message templates in response to the corresponding one of said service providers.

Application No.: 09/767,902

Docket No.: 00-VE04.75A CIP

29. (original) The method according to claim 26 wherein each of said templates corresponds to an appropriate one of (i) call progress flow and (ii) transaction processing protocol.

30. (currently amended) The method according to claim 26 wherein said templates define message formats, parameters and values and relationships among messages, parameters and values associated with control message types selected from MTP, SCCP, ISUP, TCAP and AIN type messages.

31. (original) The method according to claim 26 further comprising a step of selecting said sets of templates in response to service provider authorization data associated with respective ones of said control data messages.

32. (currently amended) The method according to claim 26 further including a step of selectively (i) enabling and inhibiting a signaling gateway from exchanging and (ii) modifying so as to bring into conformance with expectations said control data messages between said remote communication network and said signaling communication system.